P27177.A08

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re patent application of	Docket No. P27177
Jay S. Burnham, et al.	Confirmation No. 1896
Serial No:10/707,897	Group Art Unit: 2822
Filed: January 22, 2004	Examiner: Mark V. Prenty

For: SELECTIVE NITRIDATION OF GATE OXIDES

REQUEST FOR PRE-APPEAL BRIEF REVIEW

Commissioner for Patents
U.S. Patent and Trademark Office
Customer Window, Mail Stop AF
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Sir:

This request is being filed concurrently with a Notice of Appeal and is responsive to the Final Official Action of January 19, 2006.

Reconsideration and withdrawal of the 35 U.S.C. § 112, first and second paragraph, rejections, as well as the 35 U.S.C. § 103(a) rejection is respectfully requested in view of the following remarks.

A prima facie case of failing to comply with the written description requirement has not been set forth and the Rejection Under 35 U.S.C. § 112, first paragraph, Is Improper

A prima facie case of Indefiniteness has not been set forth and the Rejection Under 35 U.S.C. § 112, second paragraph, Is Improper

A prima facie case of unpatentability has not been set forth and the Rejection Under 35 U.S.C. § 103(a) Is Improper

Examiner's Assertion

The Examiner asserts that certain language in claim 25 has no support in the originally filed specification.

Applicants' Response

Applicants respectfully disagree. Paragraph [0037] of the instant application clearly describes the recited second adding of nitrogen step as one which "may add nitrogen in the range of 1×10^{13} to 1×10^{15} atoms/cm^{2}". Although Applicants incorrectly used the units "atoms/cm" instead of "atoms/cm^{2}" in the originally filed application, this was an error that one having ordinary skill in the art would recognize. Indeed, the Examiner correctly noted this error and required Applicants to correct this error in the Office Action of September 19, 2005. Again, as noted above, one having ordinary skill in the art (as demonstrated by the applied prior art documents) would clearly recognize that the dose or adding units are typically in atoms/cm^{2}. Furthermore, while the Examiner has alleged that claim 25 relates to a concentration and must therefore recite the units "atoms/cm^{3}", the Examiner has failed to appreciate the fact that claim 25 uses the language "added in the amount". This language clearly refers to the dose used to achieve the concentration and not to the concentration itself.

Examiner's Assertion

The Examiner asserts that claims 24-26 are indefinite.

Applicants' Response

Applicants respectfully disagree, While the Examiner has quoted certain language of these claims as being allegedly indefinite, the Examiner has failed to set forth any explanation whatsoever as to how or why the recited features are indefinite. Applicants submit that each recited feature is discussed in the instant specification on, e.g., paragraph [0025], and is fully supported by the disclosure. Moreover, Applicants have specified examples of concentrations which would produce the results recited in these claims. Thus, one having ordinary skill in the art, having read the specification and drawings, would have no difficulty in understanding these claims. Nor has the Examiner demonstrated otherwise.

Examiner's Assertion

In support of the obviousness rejection of claims 14, 15, 20 and 22 over CHAU '278 and KUDO, the Examiner acknowledges that CHAU '278 lacks, among other features, a second gate dielectric that is thicker than the first gate dielectric. However,

the Examiner asserted that this feature is disclosed in KUDO, and that it would have been obvious to combine the teachings of these documents.

Applicants' Response

Applicants respectfully disagree. No proper combination of CHAU '278 and KUDO discloses or suggests, for example, a first active device formed on the substrate, the first active device having a first gate dielectric, which has a first concentration of nitrogen, and a second active device formed on the substrate, the second active device having a second gate dielectric, which has a second concentration of nitrogen different than the first concentration of nitrogen, wherein the second gate dielectric is thicker than the first gate dielectric (claim 14).

CHAU '278 states at col. 4, lines 40-42, that the first gate dielectric 220 has a thickness in the range of 20-50 Å, and at col. 5, lines 1-3, that the second gate dielectric 260 has a thickness in the range of 20-50 Å. While such language arguably discloses or suggests that the first and second gate dielectrics can have the same thickness, this language does not disclose, or even suggest, that the second gate dielectric 260 is thicker than the first gate dielectric 220. Thus, the Examiner has correctly acknowledged in the Final Office Action that CHAU '278 merely discloses that the second gate dielectric has the same thickness as the first gate dielectric.

Applicants disagree, however, that KUDO cures the deficiencies of CHAU '278. While it is apparent that KUDO discloses a semiconductor device having a first active device (p-well 13) formed on the substrate 10, the first active device having a first gate dielectric 16a and a second active device (n-well 15) formed on the substrate 10, the second active device having a second gate dielectric 16b, and that KUDO discloses that the second gate dielectric 16b can be thicker than the first gate dielectric 16a (see col. 5, lines 1-11), KUDO does not disclose or suggest that the structure receives any dosage or amount of nitrogen, much less, that one active devices receives a concentration of nitrogen that is different from that of another active device.

Instead, KUDO merely discusses various stages of ion-implantation of boron, fluorine and phosphorus (see e.g., col. 3, lines 41-42 as well as col. 4, lines 1-3 and 11-13). There is simply no language in KUDO which even remotely suggests that nitrogen can be substituted for boron, fluorine or phosphorus. As such, KUDO cannot provide

any rational basis for modifying CHAU '278 in the manner asserted by the Examiner.

Nor does CHAU '278 and KUDO contain any language suggesting the apparent benefits of using both different concentrations of nitrogen and different thicknesses of gate dielectrics. The only apparent basis for modifying CHAU '278 appears to be Applicants disclosure, which is improper.

Examiner's Assertion

In support of the obviousness rejection of claims 14-16, 20, 22, 31 and 35 over CHAU '833 and KUDO, the Examiner acknowledges that CHAU '833 lacks, among other features, a second gate dielectric that is thicker than the first gate dielectric. However, the Examiner asserted that this feature is disclosed in KUDO, and that it would have been obvious to combine the teachings of these documents.

Applicants' Response

Applicants respectfully disagree. No proper combination of CHAU '833 and KUDO discloses or suggests, for example, a first active device formed on the substrate, the first active device having a first gate dielectric, which has a first concentration of nitrogen, and a second active device formed on the substrate, the second active device having a second gate dielectric, which has a second concentration of nitrogen different than the first concentration of nitrogen, wherein the second gate dielectric is thicker than the first gate dielectric (claim 14).

CHOU '833 (see Fig. 5F) discloses a semiconductor device 10 having a first active device (n-FET 14) formed on the substrate 12, the first active device having a first gate dielectric 18C, which has a first concentration of nitrogen and a second active device (p-FET 16) formed on the substrate 12, the second active device having a second gate dielectric 18B, which has a second concentration of nitrogen different than the first concentration of nitrogen (see col. 7, lines 26-33). However, CHOU '833 does not appear to disclose, or even suggest, that the second gate dielectric 18B is thicker than the first gate dielectric 18C. Indeed, the Examiner has acknowledged in the Final Office Action that CHOU '833 merely discloses that the second gate dielectric has the same thickness as the first gate dielectric.

Applicants disagree, however, that KUDO cures the deficiencies of CHAU '833. As explained above, while it is apparent that KUDO discloses a semiconductor device

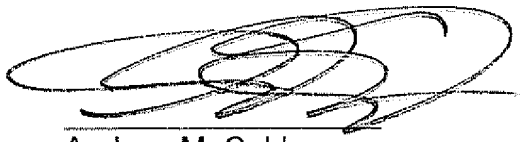
having a first active device (p-well 13) formed on the substrate 10, the first active device having a first gate dielectric 16a and a second active device (n-well 15) formed on the substrate 10, the second active device having a second gate dielectric 16b, and that KUDO discloses that the second gate dielectric 16b can be thicker than the first gate dielectric 16a (see col. 5, lines 1-11), KUDO does not disclose or suggest that the structure receives any dosage or amount of nitrogen, much less, that one active devices receives a concentration of nitrogen that is different from that of another active device.

KUDO instead merely discusses various stages of ion-implantation of boron, fluorine and phosphorus (see e.g., col. 3, lines 41-42 as well as col. 4, lines 1-3 and 11-13). There is simply no language in KUDO which even remotely suggests that nitrogen can be substituted for boron, fluorine or phosphorus. As such, KUDO cannot provide any rational basis for modifying CHAU in the manner asserted by the Examiner. Nor does CHAU '833 and KUDO contain any language suggesting the apparent benefits of using both different concentrations of nitrogen and different thicknesses of gate dielectrics. The only apparent basis for modifying CHAU '833 appears to be Applicants' disclosure, which is improper.

CONCLUSION

Reconsideration of the Final Office Action and allowance of the present application and all the claims therein are respectfully requested and now believed to be appropriate.

Respectfully submitted,
Jay S. Burnham, et al.



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